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1884/85

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UNION UNIVERSITY.

UNION COLLEGE

CIRCULAR AND CATALOGUE

FOR

1884-85.

NINETIETH YEAR.

1795.
1873.

ALBANY:
CHARLES VAN BENTHUYSEN & SONS.
1885.

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UNION COLLEGE CALENDAR, 1885.

Winter Term, 1885 begins......................Tuesday, January 6
Recess............Prayer-day for Colleges; last Thursday in Jan.
Winter Term ends...................................Friday, March 27.
Recess.
Spring Term begins...................................Monday, April 6.
Baccalaureate Sermon...............................Sunday, June 21.
Phi Beta Kappa, Trustee, Alumni meetings; Prize
Speaking ....Tuesday, June 23.
Commencement...........always on 4th Wednesday in June; 24.
Summer Vacation begins.........................Thursday, June 25.
Entrance Examinations...........Thursday, Friday, June 25, 26.
" " .....Monday, Tuesday, September 14, 15.
Fall Term begins.........................Wednesday, September 16.
Fall Term ends...........................Wednesday, December 23.
Christmas Vacation.
Winter Term, 1886, begins................Wednesday, January 6.

Commencement occurs always on the Fourth Wednesday of June, when all Alumni and Friends of Union are cordially invited to be present.

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1884/85

TRUSTEES.

Ex Officio.
- His Excellency GROVER CLEVELAND, Governor,
- Hon. DAVID B. HILL, Lieut. Governor,
- Hon JOSEPH B. CARR, Secretary of State,
- Hon. A. C. CHAPIN, Comptroller,
- Hon. ROBERT A. MAXWELL, Treasurer.
- Hon. DENNIS O'BRIEN, Attorney-General.

Rev. J. TRUMBULL BACKUS, D. D., LL. D.,
Hon. PLATT POTTER, LL. D.,
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JOSEPH W. FULLER, Esq.,
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Rev. J. LIVINGSTON REESE, D. D.,
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Rev. DENIS WORTMAN, D. D.,
Hon. JOHN T. HOFFMAN, LL. D.,
HOWARD POTTER, Esq.,
Hon. LAMOTT W. RHODES, term of office expiring June, 1885.
THOS. R. FEATHERSTONHAUGH, M. D., " 1886.
DAVID C. ROBINSON, Esq., " 1887.
Rev. GEORGE ALEXANDER, D. D., " 1888.

CURATORS OF THE LIBRARY AND OF BUILDINGS AND PARKS.

President Landon,
J. Trumbull Backus, D. D., LL. D.,
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Charles W. Wheatley, Esq.,
Custodian, Prof. Maurice Perkins, M. D.

FACULTY.

HON. JUDSON S. LANDON, President ad interim;
Lecturer on the Constitution of the United States and its History.

JOHN FOSTER, LL. D.,
Nott Professor (No. 8) of Natural Philosophy.

JONATHAN PEARSON, A. M.,
Professor of Agriculture and Botany, and Librarian.

HENRY WHITEHORNE, A. M.,
Nott Professor (No. 1) of the Greek Language and Literature.

WILLIAM WELLS, LL. D.,
Professor of Modern Languages and Literature.

MAURICE PERKINS, A. M., M. D.,
Nott Professor (No. 3) of Analytical Chemistry and Curator of the Museum.

CADY STALEY, A. M., C. E., Dean;
Professor of Civil Engineering.

ISAIAH B. PRICE, A. M., C. E.,
Professor of Mathematics and Adjunct Professor of Physics.

SIDNEY G. ASHMORE, A. M.,
Professor of the Latin Language and Literature.

WINFIELD S. CHAPLIN,
Professor of Mechanics.

WENDELL LAMOROUX, A. M,
English Essays and Oratory.

REV. GILES P. HAWLEY, A. M.,
Acting Professor of Logic, Rhetoric and Metaphysics.

1ST LIEUT. HENRY W. HUBBELL, JR., 1ST ARTILLERY, U. S. A.,
Professor of Military Science and Tactics.

SAMUEL B. HOWE, A. M.,
Adjunct Nott Professor (No. 4), Principal of Union School and Superintendent of the Schools of Schenectady.

JAMES STOLLER, A. B.,
Tutor in Natural History.

HENRY F. DE PUY, C. E.,
Tutor in Mathematics.

COLLEGE OFFICERS.

CADY STALEY,
Acting Treasurer.

MRS. M. L. PEISSNER,
Registrar.

CHARLES W. VANDEVEER.
Director of Gymnasium.

HARMANUS PICKET,
Superintendent of Grounds and Buildings.

DEPARTMENTS OF INSTRUCTION.

THE GREEK LANGUAGE AND LITERATURE.

The course of instruction in this department extends through the Freshman and the Sophomore year and the first and second term of the Junior. The object kept constantly in view throughout the course is not merely to teach so many works of an unknown tongue, but to instruct and educate the pupil by a system of mental training grounded upon the works of the most noble poets, dramatists, historians and philosophers of the ancient world. To this end, the pupil is taught not only to translate into accurate and idiomatic English, to analyze with great care the grammatical construction and to compare it with that of his own tongue, but especially to obtain a thorough knowledge and critical appreciation of the authors selected for his use.

Although there must be a general uniformity in the order in which different authors are read, yet no particular works are assigned to the several terms. The proficiency or each class determines the character of the book to be read.

THE LATIN LANGUAGE AND LITERATURE.

The course of teaching in this department during the Freshman and the Sophomore year, the first and second term of the Junior and the third term of the Senior year (elective), takes in so much of the better Latin classics (in prose and poetry) and so much practice of Latin writing as the time will allow to be well done. It is aimed to acquaint growing minds with the highest and strongest thought and with the most beautiful and finished expression of Roman men of genius and education and to familiarize the student with the structure and capabilities of a language which, if in some respects inferior, is also in some respects superior, to our own. The study is illustrated by the history and topography directly involved and by the religion, polity, science and warfare of nations as well as by the character and achievement of individuals. Light is thrown upon the Roman Language and Literature from our own, while in turn our own authors and their works are illustrated by those of Rome. The course is graduated for the several years and, although nearly uniform in amount, is varied according to the proficiency of different classes.

Modern Languages.

The Modern Languages supply the linguistic training of the Scientific course and are regular daily studies during the Freshman and the Sophomore year and two terms of the Junior year; one hour a day being given to each class, and the studies alternating according to the schedule. Instruction is imparted by exercises in translation (written and oral), conversational practice, and familiar lectures on the standard authors read.

The French Language is a regular study through six terms, beginning with the first term Freshman. The text-book mainly used in Languellier's French Course. At a later period, classical and contemporary French Literature are read.

The study of the German Language begins with the first term Sophomore. The text-books are Cook's Otto's Grammar, Whitney's Reader and the poets Schiller and Goethe.

The Italian and Spanish languages are voluntary studies, and classes are formed only when the demand is sufficient to justify them.

In addition to the text-books mentioned, are recommended Spiers and Surenne's French Pronouncing Dictionary, Adler's German and English Dictionary.

The recitations in the Modern Languages are so arranged, when practicable, that they may also be taken by regular classical students.

Logic, Rhetoric and English Language and Literature.

Hart's "Composition and Rhetoric" is used during Freshman year; Hill's "Principles of Rhetoric" with Chaucer's Prologue etc., during Sophomore year; and Macbeth and other Shakespearian dramas receive critical study in the Senior year. Logic is pursued through the first Junior term.

In the study of English Literature, it is the aim to secure an acquaintance with the historical development of the language and with the course of English thought as expressed at different periods in the works of representative men.

The instruction in Logic and Rhetoric includes the use of text-books and lectures, with exercises in oratory and the various forms of essay.

All regular students in College are required to present Essays and (Engineers excepted) Oratorical exercises during nearly the whole course. The Essays are criticised on the margin as to quality of thought, concentration and method, as to clearness, strength and harmony of style and as to grammar, spelling and punctuation. They are corrected by the student and returned to the Professor. The student is informed regarding the mental tendencies evinced in his Essays and is advised as to the reading and form of self-culture particularly adapted to his needs.

HISTORY AND POLITICAL ECONOMY.

It is purposed to give the student a knowledge of the events and philosophy of history by both lectures and recitations. In the department of Political Economy, he is taught the fundamental principles, prominent theories and practical issues of the subject and thus is prepared for the intelligent prosecution of the study.

MENTAL SCIENCE.

The elements and history of Mental Science are taught by the use of text-books, with oral explanations and illustrations. The effort is also made, to give the student a knowledge of the present position of these sciences, and of the nature and value of their problems and modes of reasoning, and thus to prepare him for intelligent investigation.

CHRISTIAN ETHICS AND BIBLICAL INSTRUCTION.

During the Senior year, instruction will be given upon the Claims and Evidences of Revealed Religion, upon Natural

Theology and Christian Ethics. The religious teaching, while distinctly and earnestly Christian, is not denominational, but, as heretofore, is consistent with the design and chartered title of the College as the representative institution of the principles of Christian Unity. Members of the Faculty and others conduct Bible classes and exert definite Christian influence upon the students. The latter have various religious associations. A room is furnished and set apart for religious uses. Service is held in the College Chapel, before the exercises of the day.

MATHEMATICS.

The course in Mathematics is arranged with special reference to the disciplinary advantages which such studies afford. At the same time their practical uses are made plain by numerous examples, illustrations and applications. In addition to the regular course, voluntary classes are formed in Analytic Geometry, Plane and Solid, and in the Calculus of Quaternions.

NATURAL PHILOSOPHY AND ASTRONOMY.

The instruction in this department begins with the first term of the Junior year. Students in the Academical department, both of the Classical and the Scientific course, and those in the Engineering department recite in two divisions (one hour being given to each division), four days in the week.

To secure at once precision and fullness, the instruction is mainly given from recently prepared text-books. Frequent lectures are however delivered, either to furnish illustration and proofs of principles by experiment or to amplify particular subjects. Thus, after the completion of Statics and Dynamics, several lectures are devoted to mechanical "work" in order that not only the construction and theory, but modes of determining the efficiency of the various hydraulic and pneumatic machines, may be understood. All lectures are required to be written out by the students in full from the notes and submitted for inspection. Numerous problems are also given on all the subjects and are mostly so constructed that the calculated results may be verified by experiments before the class. To test the accuracy of the knowledge gained and to ensure its ready command, several written examinations are required in each term.

For the demonstration and illustration of the laws of Mechanics and Physics, an extensive cabinet of apparatus has been obtained from the workshops of this country and largely from those of London, Paris and Munich. Some of these pieces may be mentioned.

Measurements.—French measures. Velocimeter for finding the number of revolutions of an axle. Dividing engine by Bianchi. Regnault's chronograph with tuning-forks, and clock for measuring time to a small fraction of a second.

Mechanics.—Models of gridiron, mercurial and Kater's reversible pendulum, of anchor and of spring escapements. Large table bearing illustrations of the modes of transmitting and transforming motions. Apparatus of Bourdon for showing the *vis viva* in a projectile. Complete apparatus for capillarity, including Simon's. Plateau's apparatus complete. Three models of the Turbine wheel. Very complete apparatus by W. and L. E. Gurley for efflux of liquids under different heads, through orifices of various shapes and through straight or bent tubes.

Heat.—Walferdin's maximum and minimum and Breguet's metallic thermometers. Regnault's apparatus for finding co-efficients of dilatation of gases. Another for same under constant pressure and also under constant volume. Hypsometer of Regnault. Apparatus complete of Botigny for spheroidal state of liquids. Apparatus complete of Regnault for determining tension of the vapor of liquids from their boiling points under varying pressures. Apparatus of Gay Lussac and of Dumas for measuring the density of vapors. Ritchie's apparatus for finding ratio between the emissive and absorbent powers. Complete apparatus of Melloni for the laws of reflection, refraction, diffusion, diathermancy, absorption and polarization of heat. Complete apparatus of Favre and Silbermann for determining heat from combustion. Pouillet's pyrheliometer.

Electricity and Magnetism.—Machines of Holtz and of Carré. Three induction coils, one giving spark of seventeen inches. Weber's grand galvanometer with telescope and scale. Thompson's reflecting galvanometer and his divided ring electrometer. Planté's secondary pile. Alliance magneto-electrical machine. Tyndall's electro-magnet for diamagnetism, rotation of polarized ray etc. Delezenne's circle. Wheatstone's bridge. Standard B. A. unit or ohm, tested at Kew. Set of resistance-coils. Jamin's large magnet, lifting nearly two hundred pounds. Large magnetic theodolite of Lamont for declination and absolute intensity.

Acoustics.—Wave apparatus, incluing Wheatstone's. Large bellows, with full set of organ pipes. Sets of plates for vibrations. Melde's, Lissajou's and Crova's apparatus.

Light.—Electric lamp of Foucault. Large size of Silbermann's heliostat. Apparatus for diffraction and interference. Large four-prism spectroscope of Steinheil. Stoke's apparatus for fluorescence. Polyprism. Prisms of Senarmont, Hartnack, Rochon and Silbermann. Prism in spar of Dessains. Phosphoroscope of Becquerel. Apparatus of Jamin for interference. Optic circle complete of Jamin. Polariscope of Norremberg with polarizing microscope. Duboscq's apparatus for projecting phenomena of double refraction and polarization. Biot's apparatus complete for rotatory polarization, including Soledi's saccharometer. Foucault's photomètre etc.

Astronomy is taught as a regular class exercise four days a week for one term. Besides this a special class is formed for the study of Practical Astronomy. The Dudley Observatory affords the means of becoming familiar with the instruments used and work carried on in first class observatories.

CHEMISTRY.

In the undergraduate department, Chemistry is taught by daily lectures and recitations during the third Sophomore term and the first and the second Junior term.

There has recently been established a regular daily two-hours course of experimental Chemistry at the Laboratory.

The Nott Laboratory is open in all branches of Chemistry for special students; especially for students of Agriculture or Medicine, Pharmaceutists, Manufacturing Chemists, Mineralogists, Metallurgists, students of Medical Jurisprudence etc.

Those who desire to devote but a portion of their time to Chemistry can pursue other studies in the Collegiate course. No previous knowledge of the science is required, though it is highly desirable.

The course includes instruction in Theoretical and Experimental Chemistry and systematic Qualitative and Quantitative Analysis, in all their branches and in their application to the arts and manufactures.

Text-books and Books of Reference.

Cooke's Chemistry.
Craft's Qualitative Chemical Analysis.
Fresenius's Analysis.
Cooke's Chemical Physics.
Miller's Chemical Physics.
Miller's Elements of Chemistry.
Dalton's Physiology.
Percy's Metallurgy.
Knapp's Chemical Technology.
Dana's Mineralogy.
Gmelin's Hand-Book of Chemistry.
Muspratt's Chemistry applied to Arts and Manufactures.
Lehmann's Physiological Chemistry.
Regnault's Elémens de Chimie.

The fee for full course of special instruction in the Laboratory is $35 per term; for half-day course, $25 per term; two-hours course, $10 per term; a deposit of $15 for materials etc. being required in the two first-mentioned courses, and one of $10 in the last; the amount not consumed being returned. The expenditure varies from $2 to $20 a term.

For fuller information, address Prof. Maurice Perkins, M. D.

Natural History.

Physiology is taught in the second Junior term to the whole class by recitations and by lectures on Comparative Anatomy and Physiology. The subjects are illustrated by preparations and dissections.

Zoölogy is taught during the third Junior term to the whole class by recitations and lectures. The work is illustrated by dissections and constant exhibition of specimens in the class-room. The Museum surpasses in some of its departments any other in this country.

GEOLOGY is taught during the first term of Senior year by a daily course of recitations and lectures.

MINERALOGY is taught during the second term by a course of practical lessons illustrated with a complete set of models of crystals and a series of six hundred specimens for determination by crystallographic and blowpipe examination.

The facilities for instruction have been largely increased by the addition of the Wheatley Collection of Minerals and Shells, the gift of E. C. Delavan, Esq.

BOTANY is taught during the Summer term both from text-book (Gray's) and practically in the field.

THE LIBRARY

contains about twenty thousand titles and has recently undergone re-classification and cataloguing on the best methods known to librarians.

There are also two good libraries belonging to the Literary Societies.

A free Reading Room has been maintained, supplied with periodicals and newspapers, native and foreign.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

First Lieut. Henry W. Hubbell, Jr., U. S. A., Commandant and Military Instructor.

Military instruction and physical culture are provided for by the following regulations of the Board of Trustees: "All able-bodied students will be expected to attend exercises in the Military Department of the College with the following exceptions: Any Senior or Junior may elect at the beginning of the term to take, instead, physical culture three times a week or history in two apportionments a week. Sophomores and Freshmen may in special cases be permitted by the Military professor and the Faculty to take instead such physical culture and study of History as shall be determined by the Faculty.

Work in the Military Department shall count as other work in the College and each student shall be credited therefor; and neglect of attendance or instruction shall debar the student from the privileges of the College the same as neglect of any other studies or duties."

Instruction in the Military Department has consisted of drill in the school of the soldier, company and battalion skirmish-drill, target-practice, military signaling, military surveying, field fortification, organization of volunteers and militia under the United States laws for service under the General Government, organization of "Supply Departments" of the United States, customs of the military service and other military instruction profitable to college graduates in the emergency of a war.

Students have been organized into Companies, each year, for instruction.

The Cadet uniform is less expensive than civilians' dress, costing from $15 to $20 complete.

The students have formed various Athletic Associations.

A well-equipped gymnasium and two bowling-alleys are open daily from 8 o'clock to 5.

Any student who is physically disabled may be excused on the certificate of the College physician, approved by the Faculty.

COURSES OF STUDY.

1. Classical Course.

This is the usual baccalaureate course. Students may pursue additional studies in other courses. Some senior studies may be exchanged for Elective studies on consent of the Faculty.

2. Scientific Course.

The modern languages are here substituted for the ancient, and the amount of mathematical and English studies is increased. Latin or Greek of the Classical course may be substituted on consent of the Faculty for French or German of the Scientific.

Some senior studies may be exchanged for Elective studies on consent of the Faculty.

3. ENGINEERING COURSE.

The instruction and practice given qualify the student for immediate usefulness in the field and office and after a moderate amount of experience for the higher positions in the profession. On satisfactory examination he receives the degree of Civil Engineer (C. E.).

4. ECLECTIC COURSE.

Any studies in the preceding courses, making a proper amount of class work, may be taken by those found qualified to pursue them. A Certificate of Attainment is given.

5. COURSE IN ANALYTICAL CHEMISTRY.

This course includes Theoretical and Experimental Chemistry, Systematic Qualitative and Quantitative Analysis, and their applications to Medicine, Manufactures, Agriculture, Mineralogy, Metallurgy etc. It provides special work in the Laboratory.

6. COURSE IN NATURAL HISTORY.

The regular course includes Physiology, Zoölogy, Botany and Geology. Farther studies may be pursued gratuitously.

The Medical Lectures of the Albany Medical College are free to all Union College students; and matriculation is granted to Union College graduates without examination.

ORDER AND PROPORTION OF STUDIES.

CLASSICAL COURSE.

FRESHMAN CLASS.

FIRST TERM.

Hours a week.		
5	Livy.	
4	Xenophon, Homer.	
5	Algebra, continued to Series	Bourdon.
	Greek prose composition.	
	Latin prose composition.	
1	English composition.	

SECOND TERM.

4	Livy, Horace (Odes and Epodes), Pliny's Letters.	
5	Xenophon, Homer, Herodotus.	
5	Algebra, completed	Bourdon.
	Greek prose composition.	
	Latin prose composition.	
1	English composition.	

THIRD TERM.

4	Horace (Odes and Epodes), Cicero.	
4	Xenophon, Herodotus, Euripides.	
3	Geometry—Books VI to IX	Legendre.
3	Trigonometry	Price.
1	English composition.	
	Greek prose composition.	
	Latin prose composition.	

English Essay in the third term.

Military Drill, Physical Culture or a substitute.

ORDER AND PROPORTION OF STUDIES.

SCIENTIFIC COURSE.

FRESHMAN CLASS.

FIRST TERM.

Hours a week.		
5	Latin or English.	
5	French Grammar	Languellier.
5	Algebra continued to Series	Bourdon.

SECOND TERM.

3	Latin or English.	
5	French Grammar and Reader	Languellier.
2	Drawing.	
5	Algebra completed	Bourdon.

THIRD TERM.

5	French Grammar and Reader	Bôcher's Otto.
3	Geometry — Books VI to IX	Legendre.
4	English.	
3	Trigonometry	Price.

English Essay in the third term.

Military Drill, Physical Culture or a substitute.

SOPHOMORE CLASS.

Classical Course.

FIRST TERM.

Hours a week.		
4	Tacitus, Horace (Satires and Epistles).	
5	Euripides, Æschylus.	
3	Rhetoric	Hill.
3	Analytical Geometry	Olney's Gen. Geom.
	Greek Prose Composition.	
	Latin " "	

SECOND TERM.

Hours a week.		
4	Horace (Ars Poetica). Plautus. Terence.	
4	Euripides, Æschylus.	
4	Conic Sections	Olney's Gen. Geom.
3	English Language and Literature.	
	Greek Prose Composition.	
	Latin " "	

THIRD TERM.

Hours a week.		
4	Horace, Juvenal, Cicero (Tusculan Disputations).	
4	Euripides, Sophocles, Plato.	
2	English Language and Literature.	
5	Chemistry.	
	Greek Prose Composition.	
	Latin " "	
	Botany (voluntary)	Gray.

English Essays, five in the year, or four if the student competes for the Prize Stage; Declamations, four.

SOPHOMORE CLASS.

Scientific Course.

FIRST TERM.

Hours a week.		
5	French Literature; alternate with German Grammar	Cook's Otto.
4	Descriptive Geometry.	
3	Rhetoric	Hill.
3	Analytic Geometry	Olney's Gen. Geom.

SECOND TERM.

5	Contemporary French Literature; alternate with German Grammar	Cook's Otto.
3	English.	
4	Calculus	Olney.
3	Descriptive Geometry.	

THIRD TERM.

5	Contemporary French Literature; alternate with German Reader	Whitney.
2	English.	
5	Chemistry (with lectures).	
3	Calculus (with lectures)	Olney.

English Essays, five in the year, or four if the student competes for the Prize Stage; Declamations, four.

JUNIOR CLASS.

Classical Course.

FIRST TERM.

Hours a week.		
4	Juvenal, Persius.	
3	Sophocles, Æschylus, Thucydides.	
5	Mechanics	Jackson.
3	Logic	Jevons.

SECOND TERM.

4	Lucretius, Quintilian, Cicero (Phil. Works), Lectures on Archaic Latin and Latin Inscriptions.	
4	Sophocles, Plato, Demosthenes.	
4	Heat, Steam Engine, Electricity, Meteorology	Foster.
3	Physiology	Huxley.

THIRD TERM.

5	Acoustics, Magnetism, Galvanism, Electro-Magnetism	Foster.
5	English Literature	Shaw.
5	Zoölogy	Nicholson.
	Botany (voluntary)	Gray.

English Essays, four in the year; Declamations, two; two Class Orations.

JUNIOR CLASS.

Scientific Course.

FIRST TERM.

Hours a week.		
4	German Literature	Whitney.
5	Mechanics	Jackson.
3	Chemistry.	
3	Logic	Jevons.

SECOND TERM.

5	German Tragedy	Goethe or Schiller.
4	Heat, Steam Engine, Electricity, Meteorology	Foster.
3	Physiology	Huxley.
3	Chemistry or Mineralogy.	

THIRD TERM.

5	Acoustics, Magnetism, Galvanism, Electro-Magnetism	Foster.
5	Zoölogy	Nicholson.
5	English Literature	Coppée.
	Botany (voluntary)	Gray.

English Essays, four in the year; Declamations, two; two Class Orations.

SENIOR CLASS.

Classical and Scientific.

FIRST TERM.

Hours a week.		
5	Metaphysics	Hamilton.
5	Geology.	
4	Optics	Jackson.
1	English.	

SECOND TERM.

Classical and Scientific.

Hours a week.		
4	Metaphysics and Ethics.	
4	Astronomy	White
4	Political Economy.	
3	English (Shakespearian Plays).	

THIRD TERM.

Classical and Scientific.

Hours a week.	
4	U. S. Constitution, History, etc.
5	Ethics, Evidences, etc.
3	History of Civilization.
2	Architecture.
1	Essays.

English Essays, four in the year; two Class Orations.

Metaphysics, Ethics, Christian Evidences and the U. S. Constitution are obligatory; but as substitute for one of the others, five recitations a week may be chosen from one or more of the Elective studies, with the consent and under the direction of the Faculty.

Special arrangements will be made for advanced work in the various departments.

SENIOR CLASS.

Elective.

FIRST TERM.

Ancient and Modern Languages.
Analytical Chemistry.
Zoölogy.
Physics.

SECOND TERM.

Elective.

Ancient and Modern Languages.
Zoölogy.
Physics.
Mineralogy.

THIRD TERM.

Elective.

Ancient and Modern Languages. In Latin, Cicero.
Physics.
Botany.
Lectures on Law.

DEGREES AND HONORS.

DEGREES.

The Degree of A. B. is conferred only on students who have entered College before the close of the first Senior term, are in full Classical or Scientific standing, have paid all dues to the College Treasury and returned all books borrowed from the Library and who attend the Conferring of Degrees or are expressly excused from such attendance. The degree of C. E. is attained as stated on page 45.

Honorary Degrees are conferred by the Corporation.

HONORS.

All Senior Commencement appointments or prizes are limited to Classical or Scientific students in full standing who have entered at or before the beginning of the Senior year, and to Engineering students in full standing entered likewise and also in full standing in the Rhetorical Department of the Scientific course. Junior and Sophomore Commencement appointments or prizes are limited to Classical or Scientific students in full standing.

Commencement Orations.

These Honors are assigned to the ten Seniors taking the highest grades on the Merit Roll of the class. Under present regulations, these ten alone become competitors for the Blatchford Oratorical Medals.

The Salutatory.

This honor is awarded to the Senior of highest standing among those appointed for Commencement Orations.

Blatchford Oratorical Medals.

Hon. Richard M. Blatchford, LL. D., of New York City, founded Oratorical Prizes consisting of two gold medals of the value of the interest on $1,000, which are given to the two members of the graduating class who deliver at Commencement the best orations; "regard being had alike to their elevated and classical character and to their graceful and effective delivery." These medals, of the values of forty and thirty dollars for the orations first and second in merit, are awarded by a committee of the Trustees and presented at the close of the exercises.

WARNER PRIZE.

Hon. Horatio G. Warner, LL. D., of Rochester, N. Y., founded an annual prize consisting of silver plate of the value of $50, to be presented at Commencement to the "graduate of Union College Classical course who shall reach the highest standing in the performance of collegiate duties and also sustain the best character for moral rectitude and deportment, without regard to religious practice or profession." The prize is awarded by the Faculty.

INGHAM PRIZE.

Hon. Albert C. Ingham, LL. D., of Meridian, N. Y., founded an annual prize of seventy dollars (in the form of plate or medal or money or both medal and money, as preferred) to be awarded at Commencement to that Senior connected with the College for not less than two years who shall offer the best essay on one of two assigned subjects in English Literature or History.

The Essay must contain not less than 4,000 words nor more than 4,500. Its signature (fictitious) and the writer's real name must be enclosed in a sealed envelop; the signature and the name of the Prize being given on the outside. The Essay with the note must be presented by the first day of June.

ALLEN ESSAY PRIZES.

Hon. Wm. F. Allen, LL. D., of Oswego, N. Y., established prizes for the three best essays on any subject, submitted by appointed members of the Senior class. They are respectively $25, $20 and $15 and are presented at Commencement.

The essay must contain not less than 2,500 words nor more than 3,000 and must be signed and presented (with note), like the Ingham Essay, by June 1st.

CLARK PRIZES FOR ESSAYS IN LITERATURE.

Prizes consisting of books are awarded at Commencement to the two members of the Junior class who offer the best essays on assigned subjects in English Literature.

The Essay must contain not less than 2,500 words nor more than 3,000 and must be signed and presented (with note), like the preceding, by June 1st.

ORATORICAL PRIZES

are presented at Commencement to the two Juniors and the two Sophomores who deliver the best orations in composition and delivery on the occasion of Prize Speaking in Commencement week. Six Juniors and four Sophomores are selected for this competition by a Committee of the Faculty on the first Saturday in June. Candidates must be in full standing on appearance before the Committee.

CLASS REGULATIONS.

A daily record of attendance at Class and Chapel and of scholarship is kept by the Professors and is transmitted by the Registrar at the end of each term or more frequently to the student's parent or guardian.

RESIDENCE.

Students not rooming in College must report their residence to the Registrar at the beginning of the term, as also any change made during the term.

Students are not allowed to change their college rooms during term time without permission of the President; for every change a sum of two dollars is added to the term-bill. Keys of rooms must be left at the Treasurer's office during vacation.

MORAL REGULATIONS.

The relation of the Faculty to the students is friendly rather than formal.

The clear evidence that a student's continuance in College is resulting in no adequate advantage to himself or is injurious to others will justify his separation from the institution.

EXPENSES AND AID.

The College term-bill includes room-rent and may thus be found as moderate as the apparently smaller bills of other institutions.

The bill for tuition and room is $40 a term; for the Laboratory Course, as on page 12. It is to be paid within the first week of the term, reasonable postponement being granted when necessary

Students, unless coming from another College, pay for entrance into the Freshman class $5; into the Sophomore $7; into the Junior $9; into the Senior $12.

The total expense of tuition, room, text-books, board, lights, washing etc. during the three terms is about $280. Board can be procured for about $4 a week; in clubs for less. Furniture may be sold at the student's departure. A durable and becoming cloth suit, including cap, approved by the Military Professor, will cost $15 to $20.

To a certain number of applicants, the College affords liberal aid in the form of Scholarships as described below:

Ordinary Scholarships.

Those of the first grade afford the incumbents at the end of each term on condition of good conduct and diligence a credit on the books of the Registrar to the full amount of the term-bill.

Those of the second grade yield on the same condition a credit to the amount of half the term-bill.

All applicants presenting testimonials of need and desert, will receive aid sufficient for the trial of one term; and the scholarships then vacant will be granted only to those who attain a certain grade for the work of that term and who will evidently be benefited by a college course.

JOHN DAVID WOLFE MEMORIAL SCHOLARSHIPS FOUNDATION.

The income of this Fund of Fifty Thousand Dollars, established by the generosity of Miss Catharine Lorillard Wolfe, furnishes to applicants pecuniary aid in various amounts.

LEVI PARSONS SCHOLARSHIPS FOUNDATION.

This generous benefaction of Fifty Thousand Dollars by Hon. Levi Parsons, maintains

Two scholarships yielding respectively three hundred dollars a-year.

Three scholarships yielding respectively two hundred dollars a-year.

Eight scholarships yielding respectively one hundred and fifty dollars a-year; this allowance, it is understood, to be henceforth considerably increased.

Among applicants, preference is given

1st, to blood relatives of the Founder, bearing his name and living in the county of Fulton, Montgomery or Hamilton in the State of New York, and especially to those bearing his name and living in Johnstown, Fulton county.

2nd, to applicants living in the following places according to the following order:

1. The villages (parishes) of Gloversville and Kingsborough, Fulton Co.;
2. The township of Johnstown;
3. The county of Fulton;
4. The adjoining counties of Montgomery and Hamilton;
5. To blood relatives living in any other part of the United States.

Nomination to scholarships is made by the Board of Trustees of the Levi Parsons Library of Gloversville and Kingsborough, Fulton Co., N. Y., and the nominees must pass satisfactory examination at the College. Applications are received by Prof. Henry Pratt, Principal of the High School, Gloversville, N. Y.

MASON SCHOLARSHIPS.

These scholarships were founded in 1881 by Miss Ellen and Miss Ida Mason, of Boston, Mass., and afford aid to deserving students. The

CLARKSON NOTT POTTER SCHOLARSHIPS

and the

CORNELL SCHOLARSHIPS

afford credits on term-bills, to deserving students. The

McCLELLAND SCHOLARSHIPS,

founded by bequest of Dr. John McClelland, of New York City, of the Class of '32, also afford aid in credits on term bills, to deserving students.

STATE SCHOLARSHIPS.

UNION SCHOOL SCHOLARSHIPS.

These scholarships are limited to pupils of the Union School in Schenectady who are sons or wards of residents. They must bring from the Principal a certificate of preparation for college and also one of abstinence during the course from tobacco and spirituous liquors and they must sign a like pledge for their College course. They receive a remission of $15 on the term-bill on condition of maintaining a grade of Eight and observing their pledge.

Application for the benefit of any Scholarship Fund except the Levi Parsons Fund must be made in writing to the President of Union College or to such person as he may appoint; and it must be accompanied by testimonials from two or more responsible persons (one of whom should be the last instructor) to the fair ability, diligence and good character of the applicant, and to his real need of aid to the extent applied for.

Continuance in any Scholarship depends on the continued worthiness of the incumbent. Grade below Eight may forfeit any Scholarship.

For further information regarding Scholarships, address the President.

ADMISSION.

The Entrance Examinations are held on the first two days and the last two days of the summer vacation, as indicated in the Calendar; also, at the opening of any term.

Candidates must be at least sixteen years old, and as a preliminary to the Entrance Examination they must call on the President and present satisfactory testimonials of character and scholarship.

Candidates from other colleges must bring letters of honorable dismission and pass satisfactory examinations.

Candidates for a Degree must enter before the close of the first Senior term.

Candidates not desiring a degree may be admitted by the President at any time to the Eclectic course, subject to suitable regulations.

Candidates not fully prepared may be admitted on trial, subject to conditions.

Candidates for the Freshman Classical course are examined in English Grammar; Arithmetic (Davies' University or an equivalent); Algebra (to equations of the second degree); Plane Geometry, five books; Allen & Greenough's Latin Grammar, including Prosody; Cæsar's Commentaries, four books; Virgil's Æneid, six books; Cicero, six Orations, including Milo; Sallust's Catiline; Sallust's Jugurtha or Virgil's Eclogues; Arnold's Latin Prose Composition, 1st part, 12 chapters; Goodwin's Greek Grammar; Greek Reader; Xenophon's Anabasis, three books; Homer's Iliad, one book; and Ancient Geography.[*]

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[*] The attention of instructors is particularly directed to the student's need of a full and accurate knowledge of the Greek and the Latin Grammar. Deficiency in this knowledge will prevent admission.

The diversity in elementary books makes much difficulty for a college. To avoid this, all instructors preparing pupils for Union are requested to use the elementary books mentioned here.

Those intending to pursue the Classical course should enter at the beginning of the Freshman year fully prepared; without such preparation, time and strength needed for regular studies are consumed in making up deficiencies. If in their preparation candidates have time to spare, it is desirable for obvious reasons that they should not anticipate the college studies.

Candidates for the Freshman Scientific course or that of Civil Engineering are examined in English Grammar, Modern Geography, Arithmetic, Algebra to equations of the second degree, and Plane Geometry, five books.

Candidates for any other class are also examined in all studies previously pursued by that class.

When a candidate is admitted, matriculation is procured by signature to the following: *I promise on honor to perform all duties incumbent on a student of Union College in a faithful and gentlemanly manner, to the best of my ability.*

STUDENTS.

c, Classical; *s*, Scientific; *e*, Engineering; *ec*, Eclectic; *l*, Laboratory.

SENIOR CLASS.

c	Frank Bailey,	Chatham.
c	George Weed Barhydt,	Albany.
c	Alvin Barber Bishop,	Hancock.
s	Frank Bond,	Schenectady.
e	Frank Edward Bradley,	Kinderhook.
c	Samuel Barlow Coffin,	Peekskill.
s	Francis Elihu Crane,	Lisha's Kill.
s	Thomas Joseph Delaney,	Albany.
e	George Washington Ebaugh,	Baltimore, Md.
s	Alvord Calvin Egelston,	Gloversville.
e	Wallace Foote,	Port Henry.
c	Everett Fowler,	Kingston.
s	Robert Hamilton Gibbes,	Union, S. C.
c	Henry De Witt Griswold,	Dryden.
s	William Hutchinson,	Thorndike, Mass.
c	Paul Iglehart,	Davidsonville, Md.
s	William Augustus Jaycox,	Garrison's
e	Ernest August Lewald,	New York City.
e	James Henry Stephen McCarthy,	Albany.
s	John Joseph McSorley,	Troy.
s	William Curtis Mills, jr,	Gloversville.
c	Edwin Mitchell,	Hagerstown, Md.
c	Jesse Thompson Morey,	Burnt Hills.
c	William Harlow Munsell,	Schenectady.
c	Edmund Taylor Perkins, jr,	Louisville, Ky.
s	Frank Weston Ray,	Columbia, S. C.
s	William Farlin Richards,	Rouse's Point.
c	Frank Millard Severson,	Seneca Falls.
c	Charles Spelman Stanton,	Albany.
c	Clarence W. Stryker,	Hammondsport.
s	Monroe Marsh Sweetland,	Dryden.
s	Edward Terrill,	Stone Ridge.

e William Henry Vaughn,	Lewiston, N. J.

Thomas Grafton Addison,	Washington, D. C.
Arthur Sylvester Anable,	Springfield, Mass.
Albert Coward Barrett,	Perth Centre.
Samuel McCrea Brann,	Charlton.
Frank Bull,	Schenectady.
Putnam Cady,	Schenectady.
Charles Wittgenstein Codwise,	Grantville, Mass.
James Landon Countermine,	Schenectady Co.
John Browner Duffie,	Columbia, S. C.
Frank Stuart Ferguson,	Gloversville.
Richard Whiting Franklin,	Penn Yan.
Edward Lincoln Garrett,	Ballston Spa.
Benjamin Sumner Guion,	Newbern, N. C.
Albert Lippincott Halsey,	Schenectady.
James Henry Haslett,	Geneva.
Edward Dorsey Hobbs, jr,	Anchorage, Ky.
Hugo William Hoffman,	Albany.
John Samuel Hoy,	Albany.
George Woodward Langdon,	Hoosac.
David Alexander Lansing,	Schenectady.
Philip W. Link,	Schenectady.
James Adelbert McCauley,	Stanley.
Thomas L. McClumpha,	Port Jackson.
Philo C. Mills,	Gloversville.
Frank Moore,	Schenectady.
Frederick Sydney Parmenter,	Troy.
George Frank Parsons,	Gloversville.
Hardy Hardison Phelps,	Creswell, N. C.
William Henry Robinson,	West Hebron.
John Schermerhorn,	Rotterdam.
Nathaniel Bull Spalding,	Schodack Landing.
George Fenly Sprague,	Le Roy.
Clarence De Willoughby Sprigg,	Alexandria, La.
Charles Malcolm Stewart,	Kingsboro.
Lawson Clay Talley,	Columbia, S. C.
George Williamson Van Vranken,	Lisha's Kill.
John Henry Veeder,	Rotterdam.
Robert James Wands,	Slingerland's.
Edward Jonathan Wheeler,	Schenectady.
Joseph Atkinson Yates,	Ten Mile Hill, S. C.

The second list indicates former members of the class.

JUNIOR CLASS.

e Thomas Warner Allen,	East Hounsfield.
c Edwin Charles Angle,	Schenectady.
c Frank Fenton Blessing,	Slingerland's.
e Gleason Hart Case,	Coxsackie.
e Howard Judson Cole,	Albany.
c Edward Weidler Courtright,	Circleville, O.
c Gustave Sylvan Dorwin,	Hammond.
c Levi Case Felthousen,	Schenectady.
e Thomas Hurmans Foote,	Port Henry.
s James John Franklin, jr,	Albany.
s Edwin Schuyler Colfax Harris,	Schuylerville.
e Edward Graham Hayes,	Canandaigua.
c Allen Heyer Jackson,	Schenectady.
s David Barton Kinne, jr,	White Lake.
s Wilbur Fisk La Monte,	Richmondville.
c William Pierce Landon,	Schenectady.
s Thomas C. Lawler,	Albany.
e Livingston John Little,	Rochester.
c James Carter McIntyre,	West Troy.
c Jesse Montgomery Mosher,	Albany.
e John Edwin Ostrander,	Slingerland's.
c John Leslie Russel Pratt,	Kansas City, Mo.
s Frederick Stephen Randall,	Stafford.
e Frederick William Skinner,	Brownville.
c Elmer Ellsworth Veeder,	Schenectady.
e Tyler Reed Woodbridge,	Port Henry.

Alvin Jonas Bogart.	Troy.
Abel Smith Clements,	Schenectady.
Cornelius Wells De Baun,	Niskayuna.
Francis Henry Edmunds,	Johnstown.
Benjamin Wool File,	Raymertown.
Elmer Lewis Fletcher,	Bluffton, Iowa.
Addison Jutkins Gallien,	Albany.
Louis William Groat,	Cooperstown.
Fred. Elmendorf Hamlin,	Winona, Minn.
Thomas Hazlett,	Geneva.
Horace Sprague Judson,	Kingsboro.
Benjamin Merrill,	Saratoga Springs.
Fred Nelson Moulton,	Sandy Creek.
Edward J. Perkins,	Amsterdam.

Silas Ray Pierson,	Newark.
George Romaine Freeman Salisbury,	Schuylerville.
William Franklin Shick,	Easton, Pa.
Sydney Alvord Smith,	Herkimer.
Harman Wortman Veeder,	Schenectady.
William Wallace Wemple,	Duanesburgh.
Alonzo Wilcox Wheeler,	Schenectady.

SOPHOMORE CLASS.

c	Charles Hamilton Ashton,	Centre Cambridge.
c	Alden Lewis Bennett,	Hyde Park, Ill.
s	Charles Francis Bridge,	Albany.
s	George D. Buel,	South Ballston.
s	Edward Madison Cameron,	Albany.
s, e	William Mark Campbell,	Troy, Minn.
s	John Ericsson Clute,	Schenectady.
s	George Thompson De Forest,	De Freestville.
s	Robert Earl, 2nd,	Herkimer.
l	Harry Slocum Estcourt,	Schenectady.
s	George Lovell Flanders,	Hopkinton.
c	George Warren Furbeck,	Little Falls, N. J.
l	Robert Furman,	Schenectady.
l	John Trumbull Backus Gilmour,	Schenectady.
s	William Gibson Gilmour,	Schenectady.
c	Nelson Joseph Gulick,	Broadalbin.
c	Edward Mathias Hawkes,	Schenectady.
c	Mather Craine Howe,	Schenectady.
e	William Franklin Huyck,	Le Roy.
c	Irving Peake Johnson,	Schenectady.
e	Willard Augustus Kitts,	Oswego.
c	Henry Augustus Kurth,	Schenectady.
ec	William Thomas Leighton,	Rochester.
s	James Alfred Long,	Florence.
c	Charles Arthur Marvin,	Elizabethtown.
s	Harlow McMillen,	Seneca Falls.
s	Charles Backman McMurray,	Lansingburgh.
s	Edward Waite Miller,	Montgomery.
s	Albert Henry Pepper,	Schenectady.
e	Alfred Edward Phillips,	Rouse's Point.
s, e	Kelton Radliff,	Gloversville.
s	Francis Xavier Ransdell,	Providence, La.
e	Nelson Manning Redfield,	Rochester.

c Edward Tallmadge Root,	Schenectady.
c J. Ward Schermerhorn,	Schenectady.
s Lester Boardman Smith,	Rochester.
e John Edward Swanker,	Schenectady.
c John Charles Van Voast,	Schenectady.
e William Henry Van Wie,	Fultonville.
e Edward Dwyer Very,	Schenectady.
e Dow Vroman,	Middleburgh.
s Robert White Williams,	Carroll Parish, La.

William Thurston Brown,	Burnt Hills.
John Morris Burr,	Greenfield Hill, Conn.
George Dudley Campbell,	Schenectady.
Pantaleon Gonzalez,	U. S. of Colombia, S. A.
Julius Theodore William Kastendieck,	Schenectady.
James Everett Kelley,	Schuylerville.
Joseph H. Riley,	Boggy Depot, Ind. Ter.
William George Shaible,	Schenectady.
Will J. Sweet,	Gloversville.
Octavio Torres,	Hermosillo, Mex.
Abraham Van Benthuysen,	Lisha's Kill.
William Van Doren,	Scotia.
William B. Wemple,	Fultonville.
George Edmund Wentworth,	Sandy Hill.
Vernon Everest Weston,	Wilmington.

FRESHMAN CLASS.

e Thomas W. Barrally,	Nantucket, Mass.
s Norman Lawrence Bates,	Oswego.
e Michael H. Begley,	Albany.
s William T. Bishop,	Fort Wingate, N. M.
c Charles Winne Blessing,	Albany.
ec James E. Brennan,	Albany.
c Philip Henry Cole,	Red Hook.
e Homer Potter Cummings,	North Madison, O.
c C. Schuyler Davis,	Schenectady.
e Frank Justus Davis,	Staffordville.
c Martin Raymond Delehanty,	Albany.
e James Monroe De Long,	Elizabethtown.
s Allen J. Dillingham,	Mechanicville.
s Van Guysling Furman,	Schenectady.
l John Duncan Gilchrist,	Ishpeming, Mich.

c Edwin Shaw Hunsicker,	Norristown, Pa.
c Antranig D. Ishkanian,	Thyatira, Turkey in Asia.
c William Logan Kennedy,	Johnstown.
c Louis Moses King,	Schenectady.
c Frank Dudley Lewis,	Amsterdam.
c Seelye William Little,	Rochester.
s Hubert Carpenter Mandeville,	Elmira.
s Edward McEncroe,	Schenectady.
c Joseph McIntyre,	West Troy.
c William Frazier Peters,	Ripley, O.
s Frederic Barnard Richards,	Sandy Hill.
e Edson Mason Scofield,	Hermon.
s Frank Hopkins Silvernail,	Valatie.
ec Michael Daniel Stevenson,	Albany.
l Martin Putnam Swart,	Schenectady.
c Thomas Henry Sweeny,	Cassville.
s William Bullock Ten Eyck,	Albany.
s Edward P. Towne,	Lansingburgh.
e Henry Miller Van Dusen,	Stockbridge, Mass.
s Gaylord Bacon Wakeman,	Wells Bridge.
s John H. Williams,	Rochester.
c Edwin Henry Winans,	Gloversville.
c John Edgar Winne,	Schodack.
c Fred. A. Yates,	Conklingville.

Fred. Samuel Simmons,	Fonda.

DEGREES CONFERRED

ON THE CLASS OF 1884.

A. B.

Dow Beekman,	Middleburgh.
Robert Russell Benedict,	Canandaigua.
Sherman Edwin Bishop,	Hancock
William Nelson Potter Daily,	Schenectady.
John Francis Delaney,	Albany.
James Gereau Greene,	Clyde.
Frederic Dixon Hall,	Antwerp.
John William Higson,	Salt Lake City, Utah.
John Blackhall Hutchison,	Brooklyn.
James Johannes Kemp,	Ballsville, Va.
Charles Adams Kitts,	Oswego.
Stephen Francis Leo,	Providence, R. I.
Reese Brown McCown,	Darlington, S. C.
John McEncroe,	Schenectady.
Herman Vedder Myndberse,	Schenectady.
Daniel Naylon, jr,	Schenectady.
Harry Van Ness Philip,	New York City.
Herbert George Porcher,	Salt Lake City, Utah.
Henry Zachariah Pratt,	Greenbush
James Stoller,	Johnstown.
William Gilliss Woolford,	Princess Anne, Md.
Harry C. Young,	Schenectady.

A. B. and C. E.

George Franklin Allison	Oswego.
Edgar Starr Barney,	Worcester.
John Skilton Bishop,	Lyons.
Wilbur Macauley Judd,	Jewett.
David Spencer Merritt,	Carmel.

Pickens Neagle	Columbia, S. C.
Charles Bradford Templeton	Albany.
Lansing Van Auken	New Scotland.

C. E.

Benjamin Guerard Chisolm	Charleston, S. C.
Arthur Harold Kasimir Jervis	Le Roy.
Raymond S. Wells	Schuylerville.

AWARDS, 1884.

COMMENCEMENT ORATIONS.

JOHN S. BISHOP, Lyons.
JOHN F. DELANEY, Albany.
JAMES G. GREENE, Clyde.
FREDERIC D. HALL, Antwerp.
WILBUR M. JUDD, Jewett.
ANDREW MCFARLANE, jr, Albany.
PICKENS NEAGLE, Columbia, S. C.
HARRY V. N. PHILIP, New York City.
HERBERT G. PORCHER, Salt Lake City, Utah.
WILLIAM G. WOOLFORD, Princess Anne, Md.

SALUTATORY.

Wilbur M. Judd.

BLATCHFORD ORATORICAL MEDALS.

1st, John F. Delaney.
2d, Harry V. N. Philip.

WARNER PRIZE.

James G. Greene.

INGHAM PRIZE.

Dow Beekman, Middleburgh.

ALLEN ESSAY PRIZES.

1st, Dow Beekman.
2d, Reese B. McCown, Darlington, S. C.
3d, James Stoller, Johnstown.

CLARK JUNIOR ESSAY PRIZES.

1st, Alvord C. Egelston, Gloversville.
2d, Jesse T. Morey, Burnt Hills.

Junior and Sophomore Oratorical Prizes.

Junior.

1st, Wallace Foote, Port Henry.
2d, William C. Mills, Gloversville.

Sophomore.

1st, James J. Franklin, Albany.
2d, Edwin C. Angle, Schenectady.

PHI BETA KAPPA.

1884.

John F. Delaney,
Andrew McFarlane, jr,
James G. Greene,
Frederic D. Hall,
James J. Kemp,
Herbert G. Porcher.

SCHOOL OF CIVIL ENGINEERING

OF

UNION COLLEGE.

FACULTY.

HON. JUDSON S. LANDON,
President.

JOHN FOSTER, LL. D.,
Professor of Natural Philosophy.

JONATHAN PEARSON, A. M.,
Professor of Botany.

WILLIAM WELLS, LL. D.,
Professor of Modern Languages and Literature.

MAURICE PERKINS, A. M., M. D.,
Professor of Chemistry.

CADY STALEY, A. M., C. E.,
Professor of Civil Engineering.

ISAIAH B. PRICE, A. M., C. E.,
Professor of Mathematics and Adjunct Professor of Physics.

WINFIELD S. CHAPLIN,
Professor of Mechanics.

REV. GILES P. HAWLEY, A. M.,
Acting Professor of Logic and Rhetoric.

1ST LIEUT. HENRY W. HUBBELL, JR., 1ST ARTILLERY, U. S. A.,
Professor of Military Tactics.

HENRY F. DE PUY, C. E.,
Tutor in Mathematics.

SCHOOL OF CIVIL ENGINEERING.

This department was founded in 1845. Its object is to give its students such instruction in the theory and practice of Civil Engineering as will qualify them for immediate usefulness in the field and office in a subordinate capacity. and at the same time fit them to fill satisfactorily the higher positions in the profession after a moderate amount of experience in the routine of practice. The course of instruction aims to effect this by constant exercise in mechanical draughting, instrumental field-work and numerical calculation, combined with the study of text-books and lectures on the numerous subjects where books are wanting.

The connection of the Engineering School with the College affords its students peculiar advantages for study in the various departments of the latter, to all of which they are admitted without extra charge.

The location of Schenectady is most favorable for an Engineering School. The city is on the Mohawk river and is intersected by several railroads and the Erie canal. These present many bridges and other works interesting to the Engineering student. There are also extensive Locomotive Works, Machine Shops and Foundries, all of which afford special advantages for examination and study.

REQUIREMENTS FOR ADMISSION.

Candidates for admission must present testimonials of good moral character and must be at least sixteen years of age.

Examinations for admission take place in presence of three College officers.

The stated times for such examinations will be found in the Calendar. By conforming to these appointments, applicants will greatly promote their own convenience and interest as well as those of the examiners.

Candidates for the Freshman class will be examined in English

Grammar, Modern Geography, Arithmetic, Algebra to Equations of the second degree, and Plane Geometry, five books.

Candidates for any other class will also be examined in all the studies previously pursued by that class.

Students from other colleges, in addition to passing a satisfactory examination, will be required to present a letter of honorable dismission.

Students may enter at any point of the course for which they are prepared.

Any studies of the course may be taken separately by those qualified to pursue them profitably.

Expenses.

Students, unless from another College, pay for entrance into the Freshman class, $5; into the Sophomore class, $7; into the Junior class, $9; into the Senior class, $12.

The College bills for tuition etc. are $40 per term. They must be paid at the beginning of each term; otherwise the Treasurer will inform the parent or guardian of the delinquency.

The extra charge for the Engineering students in the Laboratory, to comprise the cost of materials used and apparatus broken, varies from $2 to $20 per term. A deposit is required.

The price of board in the clubs varies from $3 to $4 per week and in private families from $3.50 to $5.

The expenses of instruction, board, lights, washing, text-books etc. during the three terms may vary in amount from $250 to $350.

Regarding aid, see Expenses and Aid, page 40.

Terms and Vacations.

The course of study is completed in four years. In each year there are three terms and three vacations. Commencement takes place on the fourth Wednesday in June, and the first term begins twelve weeks after that time. The second term follows the Christmas holidays and there is also a brief vacation before the opening of the third term.

Degrees.

At the beginning of the last term of the course, students who are candidates for a diploma are required to undergo a written examination on the leading points of all their preceding studies. Those who pass it satisfactorily (and complete similarly the remainder of the course) receive a diploma conferring the degree of Civil Engineer (C. E.); and it is intended that this diploma shall be a guaranty of more than average ability and industry. The others receive certificates proportioned to what they have done both as to quantity and quality. Candidates must also have paid all dues at the College Treasury, must have returned all books taken from the College Library and must be present at the conferring of Degrees unless expressly excused.

Special Students.

Those who are not candidates for a degree but desire to study Surveying, Road Engineering or any other special branches of the course can enter as special students and take such studies as they require.

Architectural Students will find a large part of the course (particularly the Draughting, Mensuration, Stereotomy, Strength and Stability, etc.) adapted to their requirements.

COURSES OF STUDY.

MATHEMATICS.

The studies of this department include the following: Algebra, beginning at equations of the second degree; Geometry, beginning at the sixth book of Davies' Legendre; Trigonometry, plane and spherical; Conic Sections; Analytical Geometry; Descriptive Geometry; Differential and Integral Calculus.

NATURAL PHILOSOPHY.

The instruction in this department commences with the first term of the Junior year, and extends through two years.

To secure at once precision and fullness, the instruction is mainly given from recently prepared text-books. Frequent lectures are, however, delivered either to furnish illustration and proofs of principles by experiment, or to amplify particular subjects. Thus, after the completion of Statics and Dynamics, several lectures are devoted to mechanical "work," in order that not only the construction and theory, but modes of determining the efficiency, of the various hydraulic and pneumatic machines may be understood. All lectures are required to be written out by the students in full from the notes and submitted for inspection. Numerous problems are also given on all the subjects, and are mostly so constructed that the calculated results may be verified by experiments before the class. To test the accuracy of the knowledge gained, and to insure its ready command, several written examinations are required in each term.

In most of the branches included in this department, the apparatus is sufficient for very complete experimental illustrations; and through the liberality of friends of the College, important additions of French, English and American instruments have been recently made.

The following are the subjects included in the course: Statics, Dynamics, Hydrostatics, Hydrodynamics, Pneumatics, Optics, Acoustics, Heat, Electricity, Magnetism and Galvanism.

ASTRONOMY.

The instruction in Astronomy includes Spherical Astronomy, Theory of Astronomical Instruments, and Physical Astronomy.

The students are also given a practical course in Astronomical Surveying and Location, comprising the determination of time, latitude and longitude, and the location of meridians, parallels, great circles and rhumb lines.

NATURAL HISTORY.

PHYSIOLOGY is taught in the second Junior term to the whole class by recitations and by lectures on Comparative Anatomy and Physiology. The subjects are illustrated by preparations and dissections.

ZOÖLOGY is taught in the third Junior term by recitations and lectures. The work is illustrated by constant exhibition of specimens and dissections in the class-room.

Instruction in Geology is given during the first term of the Senior year in a series of recitations and lectures, from sixty to seventy in number.

LITHOLOGICAL GEOLOGY. The attention of the student is first directed to a carefully identified series of specimens, and the methods and tests used in identification are given. Then, unnamed specimens are given him, the nature and constitution of which he is expected to determine by comparison and by application of the proper tests.

PALÆONTOLOGY. By the examination, on the part of the student of fossils especially characteristic of the principal formations and by lectures, the attempt is made to familiarize the mind with the more important forms of extinct animal and vegetable life. The conditions favorable and unfavorable to the preservation of such forms in the rocks are also considered. Facilities for special study of Paleontology are placed at the disposal of the student without extra charge.

HISTORICAL GEOLOGY is taught, including the different conditions under which the rock-masses occur, the order of the succession of the formations in time etc.; also,

DYNAMICAL GEOLOGY. The nature and origin of coal, peat, coral reefs, salt; the action of water in erosion, transportation etc.; of frozen water, glaciers, icebergs; the various theories of volcanic action; earthquakes and the origin of mountains; metamorphisms; veins etc.

MINERALOGY is taught during the second Senior term by a course of practical lessons, illustrated by a complete set of models of crystals and a series of six hundred specimens for determination by crystallographic and blow-pipe examination.

BOTANY is taught during the Summer term, both from text-book (Gray's) and practically in the field.

CHEMISTRY, MINERALOGY AND METALLURGY.

The recitations in Chemistry extend through two terms. In addition to this, the students receive Laboratory instruction. They are taught by means of qualitative analysis and exercise in the use of the blow-pipe, to determine the constitution of the useful minerals. Their knowledge of these minerals is increased by a course in determinative mineralogy, in which use is made of the celebrated Wheatley Collection, and a complete set of crystal models. As far as practicable, the operations of industrial chemistry are carried out. Students are taught to tin zinc and to gild iron; to electroplate with gold, silver, copper and nickel; to form the various sulpho compounds from pyrites; to burn plaster, lime and cements, and to analyze and test their efficacy; to make and examine the most important alloys; to estimate clays for buildings and fire-brick, and for the manufacture of porcelain; to analyze fuels, slags and fluxes.

The student is required to go through a thorough course in assaying, treating ores of lead, silver, copper, mercury and gold. Attached to the Laboratory is a library of technological books always open to the students for reference.

Detached from the Laboratory is a photographic room, with skylight, printing-room etc. and instruction is given by a practical photographer.

MODERN LANGUAGES.

The modern Languages supply the linguistic training of this course, and are regular daily studies during Freshman, Sophomore and most of the Junior year; one hour a day being given to each class, and the studies alternating according to the schedule.

Instruction is imparted by exercises in translation (written and oral), conversational practice and familiar lectures on the standard authors read.

The French language is a regular study through six terms, beginning with the first term Freshman. The text-book mainly used is Pujol's Complete French Course. At a later period the French dramatists, Racine and Corneille, are read.

The German language extends through six terms, commencing the first term Sophomore. The text-books are Comfort's Grammar, Whitney's Reader and the poets Schiller and Goethe.

In order to familiarize the student with reading French and German scientific works, part of the text-books of the course are in those languages.

LOGIC, RHETORIC AND ENGLISH LITERATURE.

The instruction in Logic and Rhetoric includes the use of text-books, lectures and practical exercises in the various forms of essay. In the study of English Literature, it is the aim to secure an acquaintance with the historical development of the language and with the course of English thought as expressed in different periods in the works of representative men.

The Freshmen have exercises in the elementary forms of Essay and during the first term Sophomore a text-book on Rhetoric is studied. During the Junior and the Senior year the Rhetorical exercises consist of essays and discussions; and the classics of English Literature and its history are made the subjects of lectures and of study.

Special attention is paid to writing descriptions of engineering projects and of structures and to making reports upon engineering.

DRAWING AND DESCRIPTIVE GEOMETRY.

The instruction in this department extends through three years. In the second term Freshman, the student is instructed in the use of drawing instruments and the construction of Geometrical problems ; in the first term Sophomore, in Descriptive Geometry (orthographical projection). The drawings of intersections, developments etc., are from Schroeder's models, the Paris Polytechnic School models of intersections and the Olivier models.

In the second term, Spherical Projections ; One Plane Descriptive Geometry with drawings from models of Vauban's system of Fortifications ; and the application of Descriptive Geometry to Stone Cutting, with drawings from the stereotomy models of the Paris Polytechnic School ; Shades and Shadows.

In the third term, conventional colors, free-hand drawing and drawing in plan, elevation and section. The drawings are made from models and from engineering structures.

In the first term of the Junior year, machine drawing ; in the second term, oblique projections, including mechanical, military and isometrical projections ; in the third term, topographical drawing, comprising methods of representing the relief of ground by contour lines, hatchings and shades from vertical and oblique light, Bardin's models of the various forms of ground being used to illustrate the subject ; in the first term of the Senior year, natural perspective ; in the second term, architectural drawing.

ENGINEERING.

The subjects of the course are so arranged as to harmonize with the seasons of the year suitable to field-work or other work. The course includes the following subjects :

SURVEYING. Land surveying with chain alone, chain and compass, transit, theodolite, plane-table and solar compass ; Mining Surveying ; Hydrographical Surveying ; Topographical Surveying ; Geodetic Surveying, and Astronomical Surveying and Location.

LEVELING with the plumb-line level, water level and spirit level ; Angular Leveling ; and Barometric Leveling.

MENSURATION of engineering structures.

ROAD ENGINEERING, comprising the reconnaissance, location and construction of common roads and railroads; the improvement of the surface of common roads, graveling, McAdamizing, paving, planking etc.; the construction of railroads, including earthwork, mechanic structure, superstructure and equipment.

ENGINEERING STATICS. Statical forces, weights of bodies, fluid pressure, semi-fluids, heat, cold, animal force etc.; dynamical forces, solids in motion, impact, pile-driving, waves, wind etc

STRENGTH OF MATERIALS. Data and formulas for calculating the resistance of materials to extension, compression, torsion, bending and breaking.

STABILITY OF STRUCTURES. Data and formulas for calculating the resistance of frames, roofs, bridges, retaining-walls, arches etc., against dislocation, overturning, sliding etc.

GENERAL CONSTRUCTION. Materials, foundations, masonry, carpentry etc.

BRIDGE ENGINEERING. Plans and calculations of the forms and dimensions of bridges of wood, iron or stone. A working model of a bridge, in which the strains at various points are shown by a dynamometer, illustrates the identity of the results of theory and experiment.

WATER ENGINEERING. Hydraulic formulas, the supply of water for towns and for irrigation, the removal of water by drainage and sewerage, canals, the improvement of river navigation, harbors, sea-coasts etc.

AGRICULTURAL ENGINEERING.

SANITARY ENGINEERING.

FIELD-WORK. The instruction is made as practical as possible. The students have constant practice in the field whenever the weather will permit. The field-work consists in Land Surveying with the compass and chains etc.; Triangular and Trilinear Surveying and the use of the transit, solar compass and plane table; Common, Trigonometric and Barometric Leveling and the use of the spirit-level, water-level, theodolite and barometer; Road Engineering, comprising the reconnaissance and location of a line of road, leveling the line, running curves, staking out side-slopes and foundation pits etc. (a corps for road-engineering being regularly formed, and each student taking in turn the position of flagman, chainman, rodman, leveler and transitman); Astronomical Surveying and Location and the use of the Sextant.

Voluntary Studies.

Any of the studies of the Classical or of the Scientific course of the College can be taken by the Engineering students without extra charge. Many avail themselves of this opportunity for special study in Ancient Languages, Natural History, Mental and Moral Science, Rhetoric, Logic etc.

Instruments and Apparatus.

This department is fully supplied with field instruments of the best description, comprising Transit, Surveyor's Compass, Prismatic Compass, Burneir's Compass, Solar Compass, Y Levels, the Levels of Troughton, Egault, Lenoir and Burneir; Plane Table, Sextant, Octant, Mountain Barometers, Aneroid Barometer and a Chronometer.

The extensive private collection of models and instruments belonging to the late Professor Gillespie has been purchased for the department, making the entire collection the most complete in the country.

The collection of models in Descriptive Geometry and Stereotomy is very complete. The following are some of the most important:

The Olivier Collection. This consists of about fifty models representing the most important and complicated ruled surfaces of descriptive geometry, particularly warped or twisted surfaces. Their directrices are represented by brass bars, straight or curved, to which are attached silk threads representing the elements or successive positions of the generatrices of the surfaces. Each of these threads has a weight suspended by it so as always to make it a straight line. These weights are contained in boxes sustaining the directrices and their standards. The bars are movable in various directions, carrying with them the threads still stretched straight by the weights in every position they may take; so that the forms and natures of the surface which they constitute are continually changing, while they always remain ruled surfaces. In this way a plane is transformed into a paraboloid, a cylinder into a hyperboloid etc.

These models were invented by the late Théodore Olivier, while Professor of Descriptive Geometry at the Convervatoire des Arts et Métiers, in Paris. One set of them is now deposited there, and a second is in the Conservatory of Madrid. Copies of some of them are to be found in most of the polytechnic schools of Germany. The Union College set is the original collection of the inventor, having been made in part by his own hands, ard after his death in 1853 retained by his widow till bought from her by Professor Gillespie in 1855. It is more complete than that in the Paris Conservatoire. It may be worth noticing that the silvered plates on the boxes, reading "Inventé par Théodore Olivier," etc., were added by Madame Olivier, at her own expense, after the purchase, as a tribute to the memory of her husband; her own words being, "*Je tenais à ce que chaque instrument portât le nom du savant dont la réputation passera à la postérité.*"

Among the most remarkable peculiarities of these models are their experimental demonstrations of various important theorems of Higher Geometry; as also the suggestion of a close relationship of dissimilar forms, if not their essential identity; since the movements which the various parts admit cause one surface gradually to pass into another as in a dissolving view; so that, for example, a plane is seen to be only a particular case or limit of a hyperbolic paraboloid; a cylinder and a cone to be only extreme cases of a hyperboloid of one sheet etc. At the same time the singular beauty of form and color which the models possess arouses the admiration of those entirely ignorant of their mathematical attractions.

Prof. Bardin's (Paris) plaster models (seventy) of the INTERSECTIONS of prisms, pyramids, cylinders, cones etc.

Schroeder's (Darmstadt) models (twenty) of elementary DESCRIPTIVE GEOMETRY. The planes of projection are in wood, and the lines and surfaces in metal; metals illustrating Shades and Shadows.

STONE CUTTING models (twenty) in plaster, selected from those of L'Ecole Polytechnique of Paris.

Prof. Bardin's models (ten) in plaster, of OBLIQUE ARCHES.

Groined and cloistered arch models (ten) in wood and plaster. Models of structures in stone, consisting of bridges, culverts, etc.

Winding-stair models in wood and plaster. Full-sized models of voussoirs and skew-backs of an oblique arch.

MODELS IN TOPOGRAPHY. French and German plaster models giving all the different forms of ground, accompanied by topographical drawings showing how to represent these forms by contour lines, hatchings and shades from vertical and oblique light; models and maps in colored topography; a large model of Mount Cenis Pass, showing the wagon-road and contour lines.

ARCHITECTURE. Models of the five orders of Architecture from L'Ecole des Beaux Arts, Paris; portals; stairs; roofs; walls; buttresses; domes etc.

ENGINEERING. Schroeder's models of joints, brick bonds etc.; spur wheels; bevel wheels; cranes; pile-driver; various forms of water-wheels; pumps; cylinders; valves; eccentrics etc.; steam engines.

Casts of St. Venant's models showing the changes of form in bodies subjected to flexure. Full-sized model of the liquid vein measured by Poncelet and Lesbros.

Models of Bridges on various systems, comprising truss, suspension. tabular and arch bridges; Doyné's Dynamometer Bridge Model, showing by means of a dynamometer strains at different points; models of roof trusses, arranged for using the dynamometer to show the different stresses.

Models of Fortifications, illustrating Vauban's system; shot, shell etc.

Models of Culverts, Piers, Abutments, Culvert Heads, Recess Pool, Wing Walls, Rail Sections etc.

PHYSICAL APPARATUS.

The collection of apparatus for illustrating the several branches of Natural Philosophy is very extensive. The latest and best which home and foreign workshops can produce have been procured in order to render the collection as complete as possible.

FOR PRECISE MEASUREMENTS. Steel scales of English and French measures, graduated vessels of various measures and volumes, balances by Becker and other makers, spherometer by Buff and Berger, Wollaston's goniometer, theodolites etc.

COLLECTIONS IN THE DEPARTMENT OF CHEMISTRY.

IN MINERALOGY. The Wheatley collection contains nearly 4,000 specimens of minerals, the results of the labors of Charles M. Wheatley. All of these have been labeled according to the nomenclature and order adopted by Dana. They are without exception open at all times to the students. They furnish an admirable means of practical illustration in Mineralogy, the mineralogical recitation room being connected with the large hall. Among the rare and valuable specimens are those of Anglesite, Cerusite, Mimetime and Calcupyrite, which in American specimens are equaled only by those in the British Museum. There are many fine specimens representing the noble metals from all parts of the world. There are few known species of minerals of which the collection does not contain some specimens.

In addition to this there is a large series of unlabeled specimens for crystallographic and blow-pipe examination.

IN METALLURGY. The College possesses a suite of ores of the useful metals comprising over 1,000 specimens. These have been arranged to illustrate their mode of occurrence and geographical distribution. In addition are the fluxes, fuels, etc., used in obtaining the metals from the ores, together with the slags and metals themselves in various forms. There is a large number of models and drawings of stacks, furnaces, etc.; also suites of specimens of wood, charcoal, mineral coal, peat, etc. both for actual examination and for physical inspection ; also specimens of most of the useful alloys.

IN INDUSTRIAL CHEMISTRY. A large number of specimens of the materials used in the manufacture of the mineral and of some of the organic acids ; the crude products themselves and the materials used in the manufacture of the alkalies, soaps, matches, black lead, candles, petroleum products, linseed, olive, castor, cotton-seed and other oil, paper, porcelain, glass, fire and building brick, mortar and cements, beet and cane sugars, white lead and other paints, etc., etc.

IN AGRICULTURAL CHEMISTRY. For the study of this branch of chemistry the College has a large suite of specimens of manures, natural and commercial, together with the apparatus for their analysis and also for the analysis of soils.

The Chemical Laboratory is well furnished with apparatus for work, both in analytical and manufacturing chemistry.

MAPS, DRAWINGS, ETC.

This collection embraces a large number of maps, plates, profiles, topographical drawings and spherical projections ; about fifty thousand engravings, lithographs, photographs, and detail drawings of engineering and architectural structures ; working drawings of machines, bridges, buildings, etc.

LIBRARY.

The students have the use of the College and Society Libraries. The former contains the Engineering and Scientific Library of the late Prof. Gillespie. An endowment of twenty thousand dollars enables the library to keep up with the advance of science.

PHYSICAL CULTURE.

The students are instructed in military tactics by an officer of the U. S. Army ; and a large gymnasium, completely furnished, affords ample opportunities for physical training.

For catalogues or special information, address C. STALEY, Schenectady, N. Y.

ORDER OF STUDIES.

CIVIL ENGINEERING COURSE.

FRESHMAN CLASS.

FIRST TERM.

Hours a week.		
5	French Grammar	Languellier.
5	Algebra	Davies Bourdon.
2	Drawing.	
2	History.	
1	English.	

SECOND TERM.

5	French Grammar and Reader	Languellier.
5	Algebra	Davies' Bourdon.
2	Drawing.	
2	History.	
1	English.	

THIRD TERM.

5	French Grammar and Reader	Bocher's Otto.
3	Geometry	Wentworth.
3	Trigonometry (Plane and Spherical)	Price.
3	Surveying (Parts I–III)	Gillespie.
1	English.	
3	History (voluntary).	

English Essay in the third term.

Military Drill, Physical Culture or a substitute.

SOPHOMORE CLASS.

FIRST TERM.

5	French, alternate with German Grammar	Cook's Otto.
4	Descriptive Geometry	Church.
3	Analytical Geometry	Olney.
3	Rhetoric	Hill.

SECOND TERM.

Hours a week.		
5	French, alternate with German Grammar and Reader	Cook's Otto.
4	Calculus	Olney.
3	Descriptive Geometry	Church.
3	Stereotomy.	
3	English (voluntary).	

THIRD TERM.

5	French, alternate with German.	
3	Calculus	Olney.
5	Chemistry.	
2	Higher Surveying and Levelling	Gillespie.
2	English (voluntary).	

English Essays, four during the year.

Military Drill, Physical Culture or a substitute.

JUNIOR CLASS.

FIRST TERM.

4	German.	
5	Mechanics	Jackson.
3	Elements of Mechanism	Goodeve.
3	Chemistry.	
3	Logic (voluntary).	

SECOND TERM.

5	German.	
4	Heat and Steam Engine.	
3	Analytical Mechanics	Bartlett.
3	Physiology	Huxley.
3	English (voluntary).	

THIRD TERM.

5	Electricity, Magnetism, Galvanism	Foster.
3	Strength of Materials and Stability of Structures.	
2	Steam Engine.	
5	Zoölogy.	
5	English Literature (voluntary).	

English Essays, four during the year.

Military Drill, Physical Culture or a substitute.

SENIOR CLASS.

FIRST TERM

Hours a week.		
5	Road Engineering	Gillespie.
5	Geology	Leconte.
4	Optics	Jackson.
5	Metaphysics (voluntary)	Hamilton.

SECOND TERM.

5	Engineering Construction.	
4	Astronomy.	
5	Analytical Chemistry. Mineralogy and Metallurgy. Mathematics and Physics.	Eclectic.
4	Ethics (voluntary).	
4	Political Economy (voluntary)	

THIRD TERM.

2	Architecture.
2	Law of Contracts and Right of Way. Constitution of U. S.
3	History of Civilization.
3	Physical Laboratory.
3	Philology.
3	Botany.
	Thesis.

English Essays, four during the year.

Military Drill, Physical Culture or a substitute.

UNION UNIVERSITY.

Union University, incorporated in 1873, embraces the following institutions:

Union College,
Albany Medical College,
Albany Law School,
Dudley Observatory,
Albany College of Pharmacy.

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POST-GRADUATE DEPARTMENTS

OF

UNION UNIVERSITY.

ALBANY MEDICAL COLLEGE.

Next Course of Lectures opens Tuesday, September 8th, 1885, and closes Wednesday, March 3rd, 1886. The Spring Course has been discontinued and the Regular Session lengthened to six months. The curriculum includes didactic and clinical lectures, recitations, and practical work in the laboratories and dissecting room. Clinical instruction is made a special feature of the Course.

Fees for first year—Matriculation, $5 ; Lectures, $100 ; Dissection, $10. Fees for second year—Matriculation, $5 ; Lectures, $100. Fees for third year—Matriculation, $5 ; Graduation, $25. The purchase of a Perpetual Lecture Ticket reduces the total to $200. Board may be procured for $5 a week ; in clubs for less.

The location of the College affords advantages equal to those of any other in the country.

For Catalogues and further information, address

WILLIS G. TUCKER, M. D.,
REGISTRAR,
ALBANY MEDICAL COLLEGE,
Albany, N. Y.

ALBANY LAW SCHOOL.

The first term begins on the first Tuesday of September and continues for twelve weeks; the second begins on the last Tuesday of November and continues fourteen weeks, excepting a fortnight at Christmas; the third begins on the first Tuesday of March and continues twelve weeks. Students can enter at any time.

The Course consists of lectures, examinations, and discussions in moot-court.

The advantages enjoyed at Albany—in the offices of lawyers, where many students obtain seats; in the well-chosen working-library of the School and the Law Library of the State; in the sessions of the Supreme Court and of the Court of Appeals (besides many others) presenting all forms of practice and styles of argument—surpass those of any other town of equal size.

The fee for a single term is $50, payable in advance. The fee for the full course is $130, payable in advance. To members of the Bar, the fee is $40 a term or $100 for the whole course, payable in advance.

Board, lodging etc., may be procured for $4 a week; in clubs, for less.

HORACE E. SMITH,
DEAN OF ALBANY LAW SCHOOL,
Albany, N. Y.

DUDLEY OBSERVATORY.

Astronomical and Meteorological observations are made regularly with very efficient apparatus.

Instruction is given to special students.

Prof. LEWIS BOSS,
DIRECTOR OF THE DUDLEY OBSERVATORY,
Albany, N. Y.

ALBANY COLLEGE OF PHARMACY.

The classes meet in the Albany Medical College.

The curriculum includes lectures abundantly illustrated, on Botany, Materia Medica and Pharmacognosy, theoretical, general and pharmaceutical Chemistry and theoretical and practical Pharmacy, together with practical laboratory exercises. The course is graded and extends over two years, students being divided into Junior and Senior classes. Each course occupies five months, beginning on the first Monday of October. Applicants for the degree of Graduate in Pharmacy must have attended two courses of lectures and had at least four years' practical experience with some reputable pharmacist.

FEES—Matriculation fee (paid but once), $3; Lecture tickets for the entire course, $30; Laboratory course (one term), $15; graduation fee, $10. Lectures in any one department, $12. The matriculation fee is required in advance. Lecture tickets must be procured and paid for during the first month. Students attending two full terms of lectures may continue attendance without charge. The next course of lectures will open Monday evening, October 5th, 1885.

Board and rooms can be obtained at reasonable rates. Students desiring situations will be assisted in procuring them.

ALFRED B. HUSTED, M. D.,
SECRETARY,
77 Eagle street, Albany, N. Y.

GENERAL CATALOGUE.

A General Catalogue of the Graduates of Union College has just been completed, and can be obtained by sending the price ($2.00) to the Treasurer of Union College.

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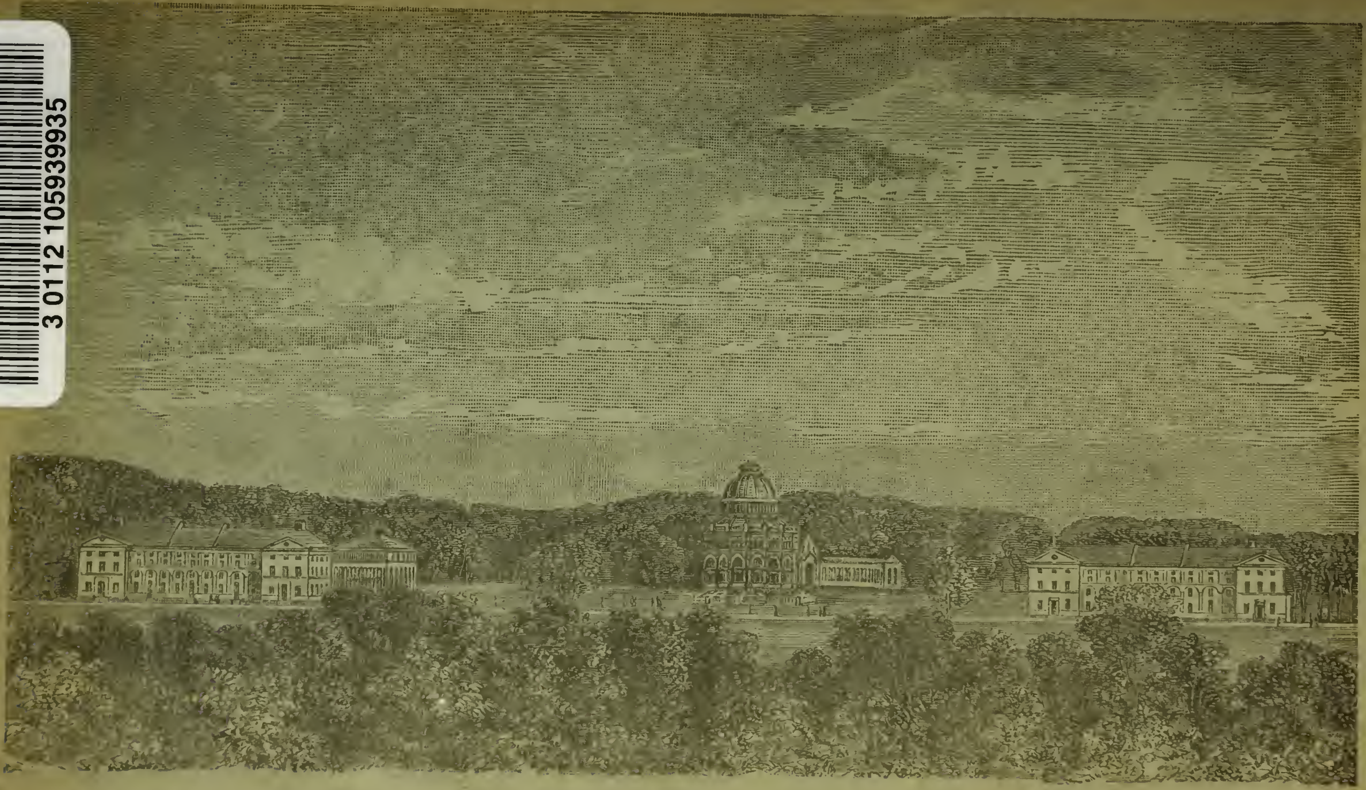

UNION COLLEGE.
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